Reevaluation Conclusion of Certain Pyrethroid Pesticides

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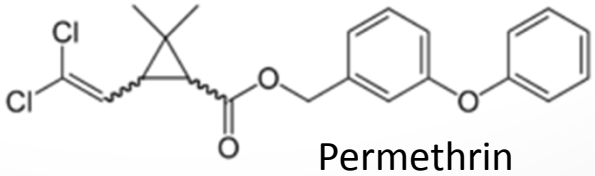
Background

- **Pyrethroids**
  - Large Class of Insecticides – Synthetic analogues of naturally occurring pyrethrins.
    - Chemistry & Environmental Fate Properties
      - Persistence and Mobility
    - Toxicity
      - High target pest toxicity
      - Low mammalian and moderate avian toxicity
      - Highly toxic to fish and aquatic organisms
    - Presence and Prevalence
      - Registered in a large number of products
        - Many are widely used in households (including pets) and in agriculture



Permethrin

DPR Overview

- *DPR's mission is to protect human health and the environment by regulating the sale and use of pesticides*
  - Pre-Registration activity
  - Post-Registration activity
    - Post-registration *continuous evaluation* activities include environmental monitoring
- Food and Agricultural Code (FAC) section 12824
  - Reevaluation of a registered pesticide is required if a significant adverse impact occurred, or is likely to occur, from its use

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Reevaluation Initiation – Basis & Scope

- **CA Notice 2006-13:** On August 31, 2006, DPR initiated the Pyrethroid Reevaluation
  - **Basis:** Monitoring surveys and toxicity studies revealing the widespread presence of pyrethroids in urban and agricultural California waterways at levels toxic to *Hyalella azteca*, an aquatic invertebrate
  - **Scope:** Includes any pesticide product containing one or more of the 20 Synthetic Pyrethroids DPR identified
    - **Excluded:**
      - Pressurized liquids/dusts/powders
      - Impregnated material (e.g., ear tags, flea collars, stakes); but not including fabric
      - Manufacturing use products

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Reevaluation Initiation – Data Requirements

- DPR divided pyrethroids into 3 groups for data requirement purposes:
  - Group I – Consists of first-generation, photo-sensitive, pyrethroids (Type I)
    - Certain environmental fate data (e-fate)
  - Groups II & III – Consist of the newer second-generation (Type II) pyrethroids
    - Group II –
      - Sediment persistence, sediment toxicity data
      - Monitoring data
    - Group III –
      - Certain e-fate data
      - Sediment persistence, sediment toxicity data
      - Off-site and transportation
      - Monitoring data

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DPR Grouping & Study Type Requirements by Group

Table 1. Active Ingredient (AI) grouping

Group I		Group II	Group III		
Bioallethrin	Prallethrin	Tau-Fluvalinate	Beta-Cyfluthrin	Deltamethrin	Lambda-Cyhalothrin
D-Allethrin	Resmethrin	Tralomethrin	Bifenthrin	Esfenvalerate	Permethrin
Imiprothrin	Tetramethrin		Cyfluthrin	Fenpropathrin	(S)-Cypermethrin
Phenothrin			Cypermethrin	Gamma-Cyhalothrin	

Table 2. Study type data requirement table by Group

	Group I	Group II	Group III
Certain environmental fate data	Required	NR	Required
Sediment persistence	NR	Required	Required
Sediment toxicity	NR	Required	Required
Off-site transport data	NR	NR	Required
Mitigation data	NR	NR	Required
Monitoring in appropriate areas	NR	Required	Required

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Data Requirements – Closer look

Environmental Fate Data:

- Water solubility;
- Octanol/water partition coefficient
- Soil adsorption coefficient, report KD and KOC (L/Kg)
- Hydrolysis half-life at pH 5, 7, 9
- Photolysis half-life in water
- Aerobic and anaerobic soil half-lives (metabolism)

Sediment Data:

- Aquatic aerobic and anaerobic degradation half-lives (metabolism) using three California sediments
- Sediment acute and chronic toxicity data for *Chironomus tentans* and *Hyallela azteca* in three California sediments
- Sediment analytical method for sediment
- Monitoring in areas appropriate to use pattern (e.g. Publicly Owned Treatment Works data)

Other Data:

- Data identifying the processes by which pyrethroids are moving off the site of application to aquatic sediments (i.e., Transport data)
- Data demonstrating the reduction or elimination of pesticide residue movement from application sites to aquatic sediments (i.e., Mitigation data)

Reevaluation Summary

- Simple Chronology & Determination

Reevaluation Summary

Based on monitoring and toxicity data, DPR determined there was a high correlation between Synthetic Pyrethroids concentrations and observed toxicity.

- 2006, August 31:
  - DPR initiates Pyrethroid Reevaluation
- 2007, January 29:
  - DPR hosts Type II Pyrethroid Reevaluation workshop to discuss study development for reevaluation data requirements
- 2007, July 19:
  - PWG submitted an overall plan to address transport mechanisms and mitigation to address off-site movement of pyrethroid residues

January 2008, Group I registrants provided all the required e-fate data.

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Revaluation Summary

- 2009, June 4: U.S. EPA Labeling Initiative
  - U.S. Environmental Protection Agency (EPA) notified registrants of new Environmental Hazard and General Labeling requirements for Pyrethroid Non-Agricultural Outdoor products (PR Notice 2008-01)
- 2009, November 11: DPR Directive (Group III AIs)
  - Focus on urban offsite movement. Major elements to this refocus were the following studies:
    - Pest Control Business Survey
    - Urban Pathway Identification Study
    - Wash-off Dynamics Study
- 2010, December 2:
  - PWG submitted the Pest Control Business Survey Final Report

Reevaluation Summary

- 2011, July 11: DPR expanded the POTW data requirement from permethrin to all Group III pyrethroids
  - Required monitoring study, and analytical method, for pyrethroids in influent, biosolids, effluent samples
- 2011, July 29: Bifenthrin Memorandum of Understanding (MOU)
  - Outdoor residential & structural use professional products
- 2012, July 19: DPR Surface Water (SW) Regulations.
  - The regulations limit applications methods and prohibit certain applications from pest control businesses

June 2012, all the required Group III e-fate and sediment data were provided.

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Reevaluation Summary

- 2013, May 30: PWG submits the Pyrethroid Pathway Identification Final Report
- 2013, October 30: PWG submits the California POTW Baseline Survey Final Report
  - 2014, April 1: Independent Laboratory Validation (ILV) Study of Analytical Methods
- 2014, May 5: PWG submitted the Wash-off Dynamics, a formulation focused study, Final Report

May 2014, all the required Group III off-site transport, mitigation, and monitoring data were submitted.

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Reevaluation Conclusion of Certain Pyrethroid Pesticide Products

- **CA Notice 2014-07:** On May 22, 2014, DPR concluded the Pyrethroid Reevaluation.
  - **DPR determination:**
    - All the required data for the development and implementation of mitigation measures to address outdoor residential use patterns have been provided.
    - The SW Regulations, will minimize off-site movement of pyrethroids from hard non-porous surfaces and prohibits certain applications.
      - Use restrictions and certain prohibitions on outdoor residential use pyrethroids represented the most effective opportunity to reduce pyrethroids in California water bodies.
    - No additional mitigation for outdoor residential uses are necessary at this time.

DPR will continue to monitor urban pyrethroid use, and will monitor and address agricultural and indoor use patterns.

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Questions?

Website:

http://cdpr.ca.gov/docs/registration/reevaluation/chemicals/pyrethroids.htm

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